

Definition and Scope (1 of 2)

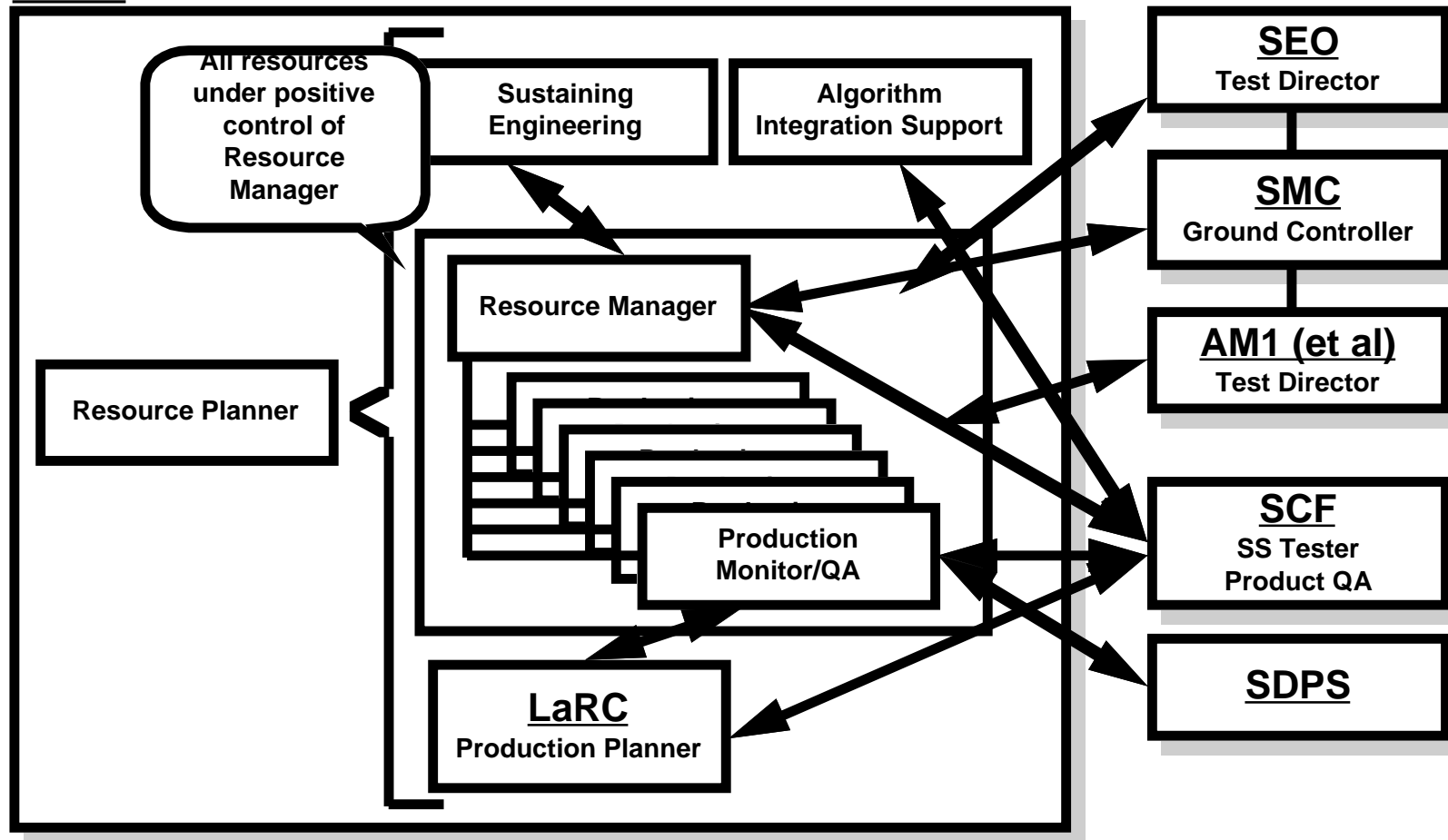
- **23-Feb-98, ECS Management and Engineering at LaRC:**
 - **Management review meetings**
 - **Sustaining engineering**
 - » **System engineering**
 - » **SW engineering**
 - » **Testing**
 - **Configuration management**
 - **Algorithm integration support**
 - **Resource Planner/Performance Analysis**
 - **Property management/ILS**
 - **User services**
 - **Data base administration**

Definition and Scope (2 of 2)

- **23-Feb-98, ECS Operations at LaRC:**
 - Operations supervision
 - Production planning and scheduling
 - Product generation
 - Resource management
 - Data ingest and distribution
 - Archive/data server management
 - System administration/computer operations
 - Hardware maintenance
 - V0 data migration

Operational Organizational I/Fs

LaRC



Selected Roles and Responsibilities for Scenario (1 of 8)

- **LaRC DAAC ECS Personnel**
 - **Sustaining Engineering**
 - » Perform LaRC DAAC local test
 - » Support SEO system-wide test
 - » Support EOS-AM1 Release B test
 - **Algorithm Integration**
 - » Provide on-site Science Tool Kit expertise and support to DAAC Scientist / Science Support Teams in the test and integration of science S/W (both updates and new S/W) into the ECS system
 - » Provide support to DAAC Scientist, Science Support Teams and the Instrument Team scientists in the development and integration of algorithms (science S/W) for both updates and new algorithms into the ECS system. In accordance with SCF policy, provide science production QA and problem resolution with the SCF. Support USO in responding to highly technical user assistance requests.

Selected Roles and Responsibilities for Scenario (2 of 8)

- **LaRC DAAC ECS Personnel (continued)**
 - **Resource Planner**
 - » Coordinate ECS resource utilization with Sustaining Engineering, SMC, SCF, and other authorized users
 - » Build and manage resource plan
 - **Production Planner/Scheduler**
 - » Develop rolling 30 day plan once every two weeks
 - » Develop rolling 10 day detailed plan each week

Selected Roles and Responsibilities for Scenario (3 of 8)

- **LaRC DAAC ECS Personnel (continued)**
 - **Resource Manager**
 - » **On-line management of operational resources**
 - » **Configure operational resources in accordance with approved resource schedule and operational resource baseline**
 - » **Re-configure in response to utilization requirements, changes and anomalies.**
 - » **Monitor, manage and control the local area network and system**
 - » **Take corrective action to respond to anomalies**
 - » **Coordinate with SMC**
 - » **Assist in diagnosis and isolation of hardware and software problems**
 - » **Maintain system configuration tables**
 - » **Monitor and report on resources performance to management.**

Selected Roles and Responsibilities for Scenario (4 of 8)

- **LaRC DAAC ECS Personnel (continued)**
 - **Operations/Production Monitor**
 - » **Manage processing queues**
 - » **Monitor Data Processing Request execution status**
 - » **Manage / optimize production resource utilization**
 - » **Monitor quality and completeness of input and output using science software provided QA tools**
 - » **Provide production reports.**
 - **Ingest/Distribution Technician**
 - » **Receive, log, ingest and disposition all incoming non-electronic media**
 - » **Monitor electronic and manual ingest of data. Coordinate with sender to resolve any ingest problems**
 - » **Monitor electronic and perform physical distribution of data.**
 - » **Load / unload media from write devices, assemble "data packages", package, label, and ship output to science users. Follow up and trace undelivered output**
 - » **Receive, open, and route incoming mail to appropriate action department.**

Selected Roles and Responsibilities for Scenario (5 of 8)

- **LaRC DAAC ECS Personnel (continued)**
 - **Archive Manager**
 - » **Manage input, storage and output of science data**
 - » **Manage ingest data server(s) and archive, ensuring data is made available for use in science production operations, to fill user requests and that data is successfully archived**
 - » **Oversee ingest and distribution functions**
 - » **Ensure the successful backup of science data**
 - » **Perform periodic media sampling and refresh as required and periodic preventive maintenance of archive media**
 - » **Establish and maintain data server and ingest-archive-retrieval subsystem configurations**
 - » **Status and report on ingest-archive-retrieval subsystem performance.**

Selected Roles and Responsibilities for Scenario (6 of 8)

- **LaRC DAAC ECS Personnel (continued)**
 - **System Administrator/Computer Operator**
 - » Operate the host processors, support restarts/reboots, configure / re-configure resources as directed, monitor system status, respond to console messages and do initial program loads for all system upgrades
 - » Perform minor housekeeping maintenance, system back-up and recovery operator level preventive maintenance and problem diagnosis and recovery
 - » Administer the networked workstations supporting the M&O staff.
 - **Hardware Maintenance**
 - » Coordinate/provide maintenance of ECS hardware
 - » Manage operations expendables (e.g., hard media, paper, ...)
 - **V0 Data Migration**
 - » Execute and monitor SW that migrates data from V0 to ECS
 - » Provide production quality assurance that migration SW properly executed

Selected Roles and Responsibilities for Scenario (7 of 8)

- **SMC**
 - **Ground Controller**
 - » Coordinate system-wide testing with Resource Manager
 - » Monitor system performance
 - » Support fault isolation between and among the DAACs, communications networks, SCFs, users, etc.
- **SEO**
 - **Test Director**
 - » Develop detailed test plans and procedures for ECS system-wide testing
 - » Coordinate and monitor execution of tests
- **AM1**
 - **Test Director**
 - » Develop detailed test plans and procedures for ECS AM1 Release B test
 - » Coordinate and monitor execution of tests

Selected Roles and Responsibilities for Scenario (8 of 8)

- **SCF**
 - **QA**
 - » Provide product QA on CERES products
 - **Test Director**
 - » Develop detailed test plans and procedures for CERES science SW test
 - » Coordinate, execute and monitor test

Day in the Life LaRC DAAC Monday, 23-Feb-98

LaRC Prologue

- **LaRC DAAC, Monday, 23-Feb-98, 7:00 AM**
- **5 days/week, 8 hours/day**
 - Management and engineering
 - User services
 - Algorithm integration support
 - Data ingest/distribution
- **7 days/week, 16 hours/day**
 - CERES standard product generation ongoing
 - V0 data migration ongoing
- **Yesterday**
 - Network problems slowed planned product generation and data distribution

Monday, 23-Feb-98, LaRC DAAC

ECS Engineering Activities

Slide A	AM					PM											
	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
Management & Administration		A1		A2		A3											
Sustaining Engineering		A1	A3	A2			A4		A3	A5	A7						
Config. Mgt. Administrator				A2		A3											
Algorithm Integrator						A3		A6									
Resource Planner/ Performance Analysis		A1		A2		A3											
Property Management/ Integ. Log. Support				A2		A3											
User Services**		A1		A2		A3											
Data Base Administrator				A2		A3											
Production Planner/ Scheduler						A3											

** User Services performed by DAAC personnel

Monday, 23-Feb-98, LaRC DAAC

ECS Engineering Activities

Management, Science Support and Engineering:

- A1. Review weekend activities and planned Monday activities at *LaRC Daily Operations Review* meeting**
- A2. Review weekly maintenance and operations activities *LaRC M&O Weekly Review* meeting**
- A3. Perform daily engineering & management tasks**
- A4. Perform LaRC Sustaining Engineering SW testing**
- A5. Support GSFC Sustaining Engineering Organization (SEO) system testing**
- A6. Support CERES Science SW testing**
- A7. Support AM1 interface testing**

Monday, 23-Feb-98, LaRC DAAC

ECS Operations Activities

Slide B	AM						PM														AM	
	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1			
Operations Supervisor		B1A 1		A2	B2																	
Production Monitor/QA					B3			A6 B9			A7		B3									
Resource Manager		B1A 1		A2	B4			B9	A5		A7		B4						B4u			
Ingest/ Distribution Technician					B5									B5u								
Archive Manager					B6		A4		B9		A7		B6		B10				B8u			
System Administrator/ Computer Operator					B7				B9				B7									
Hardware Maintenance					B8				B9				B8		B10							
V0 Data Migration					B11										B11u							

Monday, 23-Feb-98, LaRC DAAC

ECS Operations Activities (1 of 3)

Operations Supervisor:

- B1. Data collection, vu-graph generation**
- B2. Daily engineering & management tasks**

Monday, 23-Feb-98, LaRC DAAC

ECS Operations Activities (2 of 3)

Operations Crew:

- B3. First and second shift, production monitoring and QA**
- B4. First and second shift, resource management**
- B4u. Unattended LSM data collection**
- B5. First shift, data ingest and distribution**
- B5u. Unattended data ingest and distribution operations**
- B6. First and second shift, archive management**
- B6u. Unattended data server & archive operations**
- B7. First and second shift, system administration & computer operations**
- B8. First and second shift, hardware maintenance**
- B9. First and second shift overlap**

Monday, 23-Feb-98, LaRC DAAC

ECS Operations Activities (3 of 3)

Operations Crew (continued):

- B10. Archive HW maintenance period**
- B11. First shift V0 data migration operations**
- B11u. Unattended V0 data migration operations**

Monday, 23-Feb-98, LaRC DAAC

First Shift ECS Operations Activities

Slide C	AM												PM																		
	7			8			9			10			11			12			1			2			3			4			
Sustaining Engineering					A1				A2				A3	C27			A4	C28	C29							A5					
																									C30						
Production Monitor/QA Operator	C7										B3									A			B9				B3				
																						C8	C9			C10					
Resource Manager	C11	B4		B1	A1	B4		A2								C12	B4		C13	C14				C9				A5			
																									C15			B4			
Ingest/ Distribution Technician													B5															B5u			
Archive Manager	C16				C17					C17			B6						A4					C19	B9		B6				
System Administrator/ Computer Operator	C20																		C21				C22				B9	C24		C25	
													B7															B7			
Hardware Maintenance													B8						C26						B9			B8			
V0 Data Migration	C31													B11															B11u		

Monday, 23-Feb-98, LaRC DAAC

First Shift ECS Operations Activities (1 of 6)

Production Monitor/QA Operator:

C1-C6. Not used

C7. Review today's plan, have RM configure product generation HW & SW in accordance with today's plan.

C8. Coordinate with Resource Manager on use of product generation resources for CERES testing (see C13); approve release of resources to CERES SW test team

C9. At shift change, operator briefs the second shift operator on the daily plan and its status, configuration of the resources, including expected return of test resources, etc.

C10. Coordinate return of resources from test to operations with Resource Manager

Monday, 23-Feb-98, LaRC DAAC

First Shift ECS Operations Activities (2 of 6)

Resource Manager:

- C9. At shift change, operator briefs the second shift operator on the daily plan and its status, configuration of the resources, including expected return of test resources, etc.**
- C11. Review today's resource usage plan, configure resources to begin product generation operations, coordinate with SMC to return monitoring function to LaRC**
- C12. Coordinate use of data server resources by LaRC Sustaining Engineering with Archive Manager (see C18) and test team (see C27); after Archive Manager approval, configure resources**
- C13. Coordinate use of product generation resources by CERES Science team with Production Monitor (see C8); after Production Monitor approval, configure resources**

Monday, 23-Feb-98, LaRC DAAC

First Shift ECS Operations Activities (3 of 6)

Resource Manager (continued):

- C14. Coordinate return of data server resources with Archive Manager (see C19) and test team (see C29); after Archive Manager approval, configure resources**
- C15. Via telephone, coordinate use of local system manager (LSM) resources by GSFC SEO test team; configure resources**

Monday, 23-Feb-98, LaRC DAAC

First Shift ECS Operations Activities (4 of 6)

Archive Manager

- C16. Review today's plan, have RM configure data server/archive HW & SW in accordance with today's plan**
- C17. Monitor Resource Manager's displays and alarms while RM is off of the operations floor**
- C18. Coordinate use of data server resources by LaRC Sustaining Engineering with Resource Manager (see C12); approve release of resources**
- C19. Coordinate return of data server resources with Resource Manager and test team (see C14); approve return of resources**

Monday, 23-Feb-98, LaRC DAAC

First Shift ECS Operations Activities (5 of 6)

System Administrator/Computer Operator:

- C20. Assist Ingest/Distribution Technician in generation and packaging of physical media**
- C21. Assist LaRC test team by mounting removable media**
- C22. Assist CERES test team by mounting removable media**
- C23. Assist LaRC test team by dismounting removable media**
- C24. Assist CERES test team by dismounting removable media**
- C25. Initiate daily backup of part of system**

Hardware Maintainer

- C26. Pull extra archive media from inventory for later loading**

Monday, 23-Feb-98, LaRC DAAC

First Shift ECS Operations Activities (6 of 6)

V0 Data Migration

- C31. Review unattended data migration results; work with production planner/scheduler to modify day's plan**

Sustaining Engineering:

- C27. Coordinate test resource usage with Resource Manager; provide mountable media to System Administrator/Computer Operator**
- C28. Conduct testing. Capture test results.**
- C29. Have System Administrator/Computer Operator dismount removable media; coordinate with Resource Manager for return of test resources**
- C30. Support GSFC SEO organization testing as required**

Monday, 23-Feb-98, LaRC DAAC

Second Shift ECS Operations Activities

Slide D	PM																								AM			
	3			4			5			6			7			8			9			10			11			12
Sustaining Engineering				A5				A7																				
				C20				D2																				
				D1				D3																				
Production Monitor/QA	B9							A7																		D7		
	C9			C10			D4	D5	D6	B3																		
Resource Manager	C9			A5				A7								D11						D12				D13		B4u
				D13			D8	D9	D10	B4																		
Ingest/ Distribution Technician				C15																								
				D14																								
Archive Manager	B5																											
Archive Manager	B9							A7																		D14		B6u
								D4	D5	D6	B6					D15						D16						
System Administrator/ Computer Operator				C24	C25																							
	B9							D17					D18															
Hardware Maintenance																												
	B9																											
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Monday, 23-Feb-98, LaRC DAAC

Second Shift ECS Operations Activities (1 of 8)

Sustaining Engineering:

- D1. Attend pre-test meeting/telecon; review resource requirements; coordinate resource requirements with operations crew**
- D2. Observe testing; fill in at operational positions as needed; create test log and Discrepancy Reports as required**
- D3. Capture test results and data; attend post-test meeting/telecon. Review discrepancy reports with test team**

Monday, 23-Feb-98, LaRC DAAC

Second Shift ECS Operations Activities (2 of 8)

Production Monitor/QA Operator:

- D4. Coordinate with Resource Manager on use of Release B product generation resources for AM1 testing (see D8); approve release of resources to test team.**
- D5. Execute test procedures on Release B resources; monitor both test and TRMM/CERES Release A resource performance**
- D6. Coordinate return of Release B resources from test to operations with Resource Manager**
- D7. Coordinate with Resource Manager to configure Release A product generation resources for nightly shutdown**

Monday, 23-Feb-98, LaRC DAAC

Second Shift ECS Operations Activities (3 of 8)

Resource Manager:

- D8. Coordinate with Production Monitor/QA Operator and Archive Manager on use of Release B resources for AM1 testing; after other operator's approval, configure Release B resources**
- D9. Monitor performance of test resources while also monitoring operational resources**
- D10. Coordinate return of Release B resources from testing with other operators and testing personnel; configure resources**
- D11. Coordinate with Archive Manager (see D15) and Hardware Maintainer (see D19) on performance of HW maintenance on archive robotics; configure resources after Archive Manager approval**

Monday, 23-Feb-98, LaRC DAAC

Second Shift ECS Operations Activities (4 of 8)

Resource Manager (continued):

- D12. Coordinate with Archive Manager (see D16) and Hardware Maintainer (see D20) at completion of HW maintenance on archive robotics; configure resources after Archive Manager approval to return to operations**
- D13. Coordinate with Production Monitor on nightly shutdown of product generation resources. Coordinate with V0 Data Migration, Ingest/Distribution Technician and Archive Manager on unattended operations. Coordinate with SMC on remote monitoring of LaRC unattended resources after crew leaves; configure resources**

Monday, 23-Feb-98, LaRC DAAC

Second Shift ECS Operations Activities (5 of 8)

Ingest/Distribution Technician:

- D14. Coordinate with Resource Manager to configure ingest resources for unattended operations**

Monday, 23-Feb-98, LaRC DAAC

Second Shift ECS Operations Activities (6 of 8)

Archive Manager:

- D4. Coordinate with Resource Manager on use of archive resources for AM1 testing (see D8); approve release of resources to test team.**
- D5. Execute test procedures; monitor test resource performance**
- D6. Coordinate return of resources from test to operations with Resource Manager**
- D14. Coordinate with Resource Manager to configure product generation resources for unattended operations**
- D15. Coordinate with Resource Manager (see D11) on performance of HW maintenance on archive robotics; approve transfer of archive robotics from operations to maintenance**
- D16. Coordinate with Resource Manager (see D12) at completion of HW maintenance on archive robotics; accept transfer of archive robotics from maintenance to operations**

Monday, 23-Feb-98, LaRC DAAC

Second Shift ECS Operations Activities (7 of 8)

Archive Manager (continued):

- D15. Coordinate with Resource Manager (see D11) on performance of HW maintenance on archive robotics; approve transfer of archive robotics from operations to maintenance**
- D16. Coordinate with Resource Manager (see D12) at completion of HW maintenance on archive robotics; accept transfer of archive robotics from maintenance to operations**

Monday, 23-Feb-98, LaRC DAAC

Second Shift ECS Operations Activities (8 of 8)

System Administrator/Computer Operator:

- D17. Assist AM1 test team by mounting removable media on Release B resources**
- D18. Assist AM1 test team by dismounting removable media from Release B resources**

Hardware Maintainer:

- D19. Coordinate with Resource Manager (see D11) on performance of HW maintenance on archive robotics.**
- D20. Perform HW maintenance including loading of new media**
- D21. Coordinate with Resource Manager (see D12) at completion of HW maintenance on archive robotics**

V0 Data Migration:

- D14. Coordinate with Resource Manager for unattended V0 data migration operations**

Monday, 23-Feb-98, LaRC DAAC

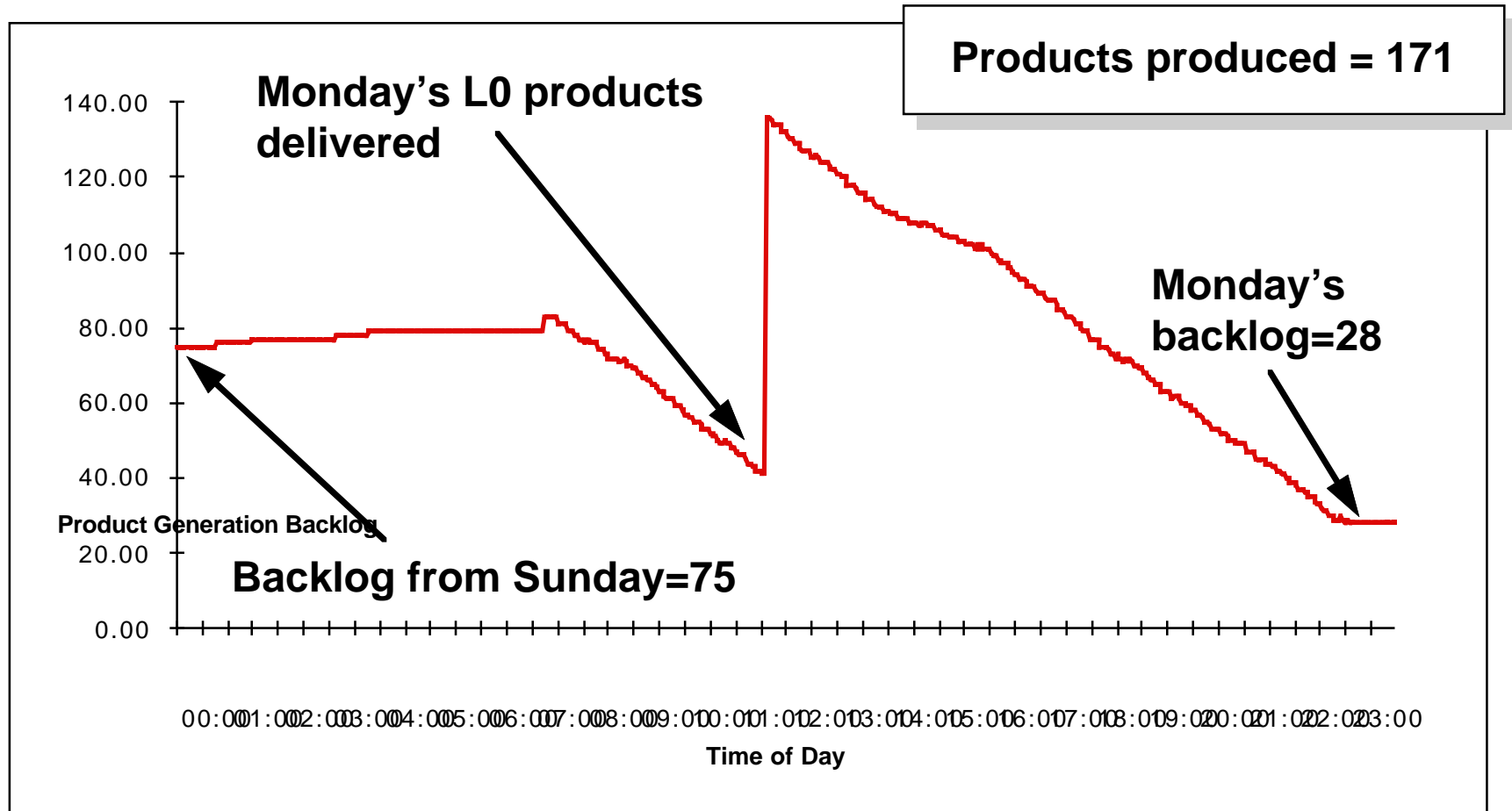
Production Monitor/QA

- **Today's product generation plan (from AHWGP data):**

– Hourly products	4 products	96 today
– Daily products	3 products	3 today
– Once every five days	1 product	} 1 today
– Once every 10 days	1 product	
– Monthly products	6 products	
- **Backlog jobs from Sunday:** 75
- **Average # of ad hoc jobs during 24 hr period:** 20
- **Average run time of a job at 1x:** 00:09:00
- **Run time variability:** + or - 00:05:00
- **Processing capacity each string:** 0.9x

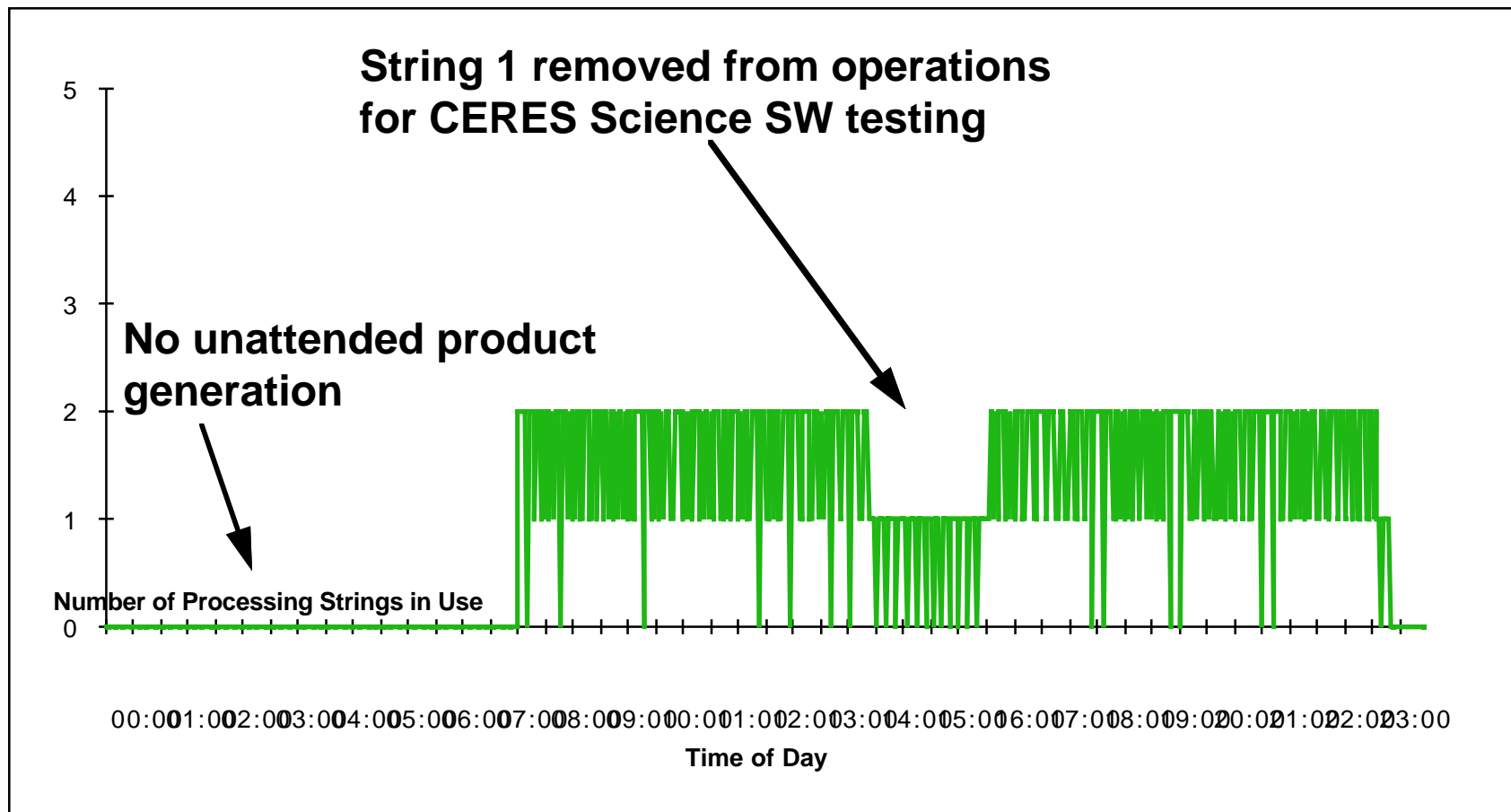
Monday, 23-Feb-98, LaRC DAAC

Product Generation Queue



Monday, 23-Feb-98, LaRC DAAC

Production Strings Utilization



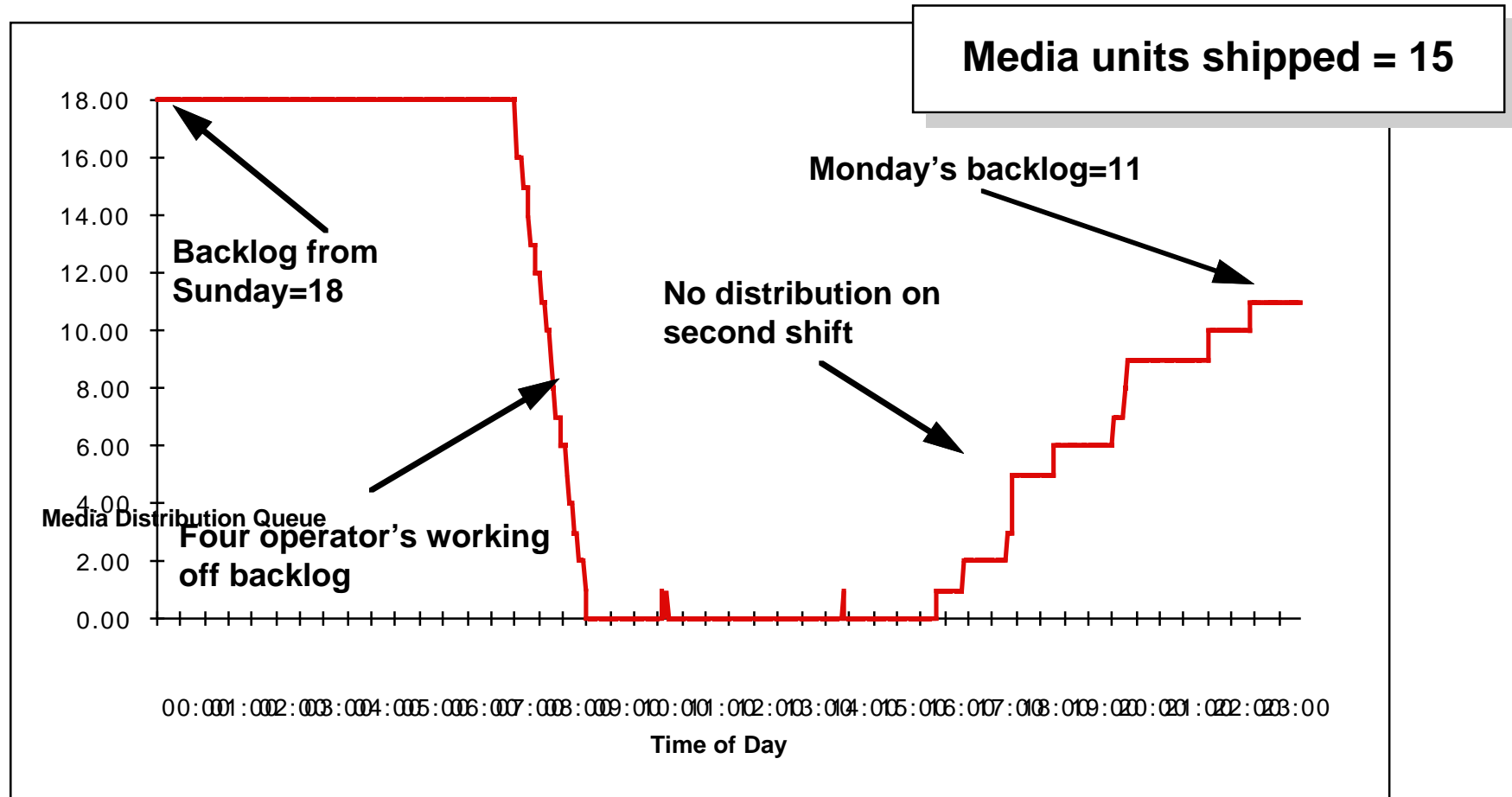
Monday, 23-Feb-98, LaRC DAAC

10% Hard Media Data Distribution

- **% of data distributed via hard media:** **10%**
- **Backlog jobs from Sunday:** **18**
- **Avg time to build and prepare media:** **00:12:00**
- **Job time variability:** **00:06:00**
- **Productivity of each of 3 Data I/D Techs.:** **0.75**
- **Productivity of Sys. Admin/Comp. Oper.:** **0.50**

Monday, 23-Feb-98, LaRC DAAC

10% Hard Media Data Distribution Backlog



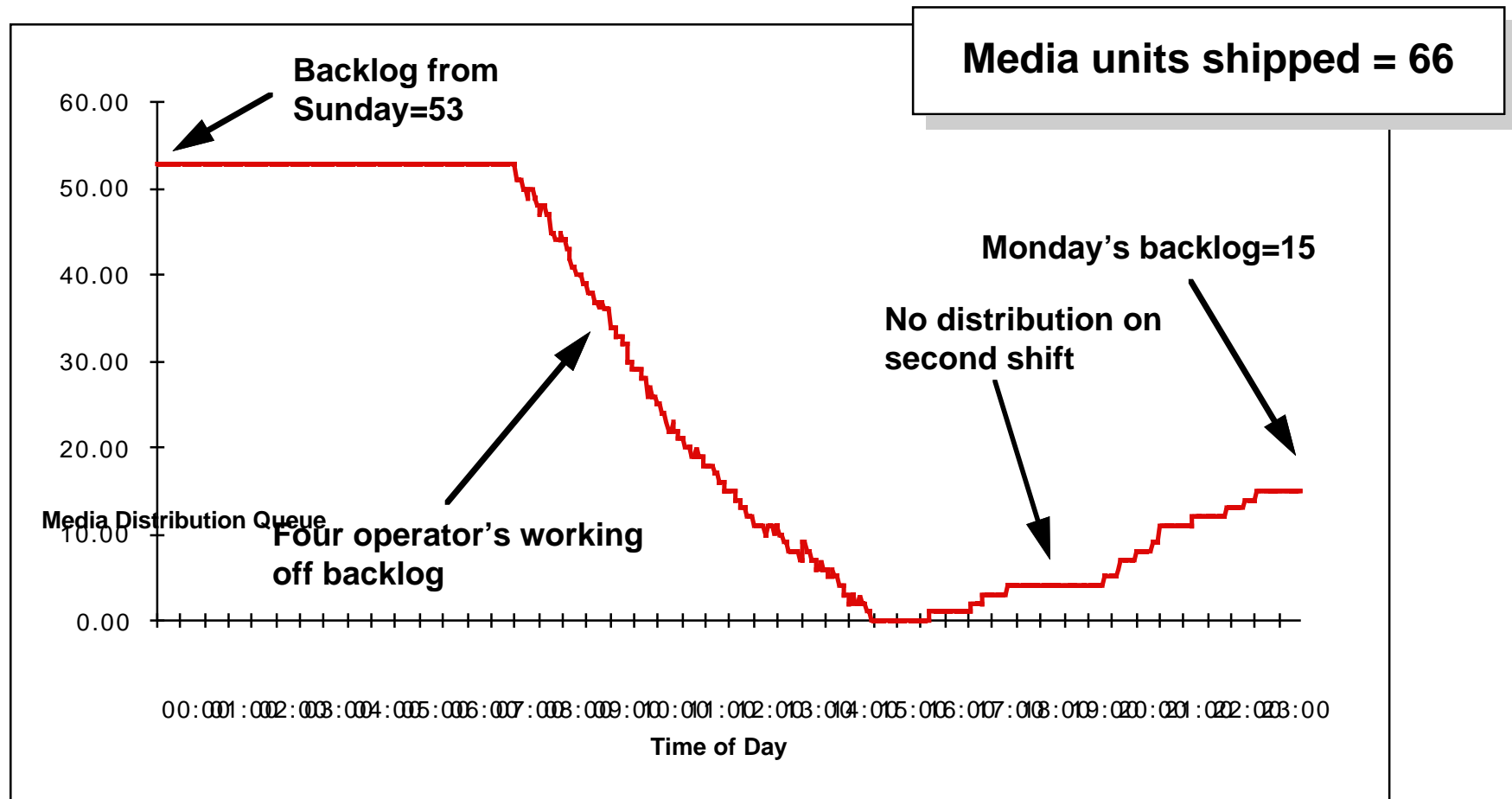
Monday, 23-Feb-98, LaRC DAAC

30% Hard Media Data Distribution

- **% of data distributed via hard media:** **30%**
- **Backlog jobs from Sunday:** **53**
- **Avg time to build and prepare media:** **00:12:00**
- **Job time variability:** **00:06:00**
- **Productivity of each of 3 Data I/D Techs.:** **0.75**
- **Productivity of Sys. Admin/Comp. Oper.:** **0.50**

Monday, 23-Feb-98, LaRC DAAC

30% Hard Media Data Distribution Backlog



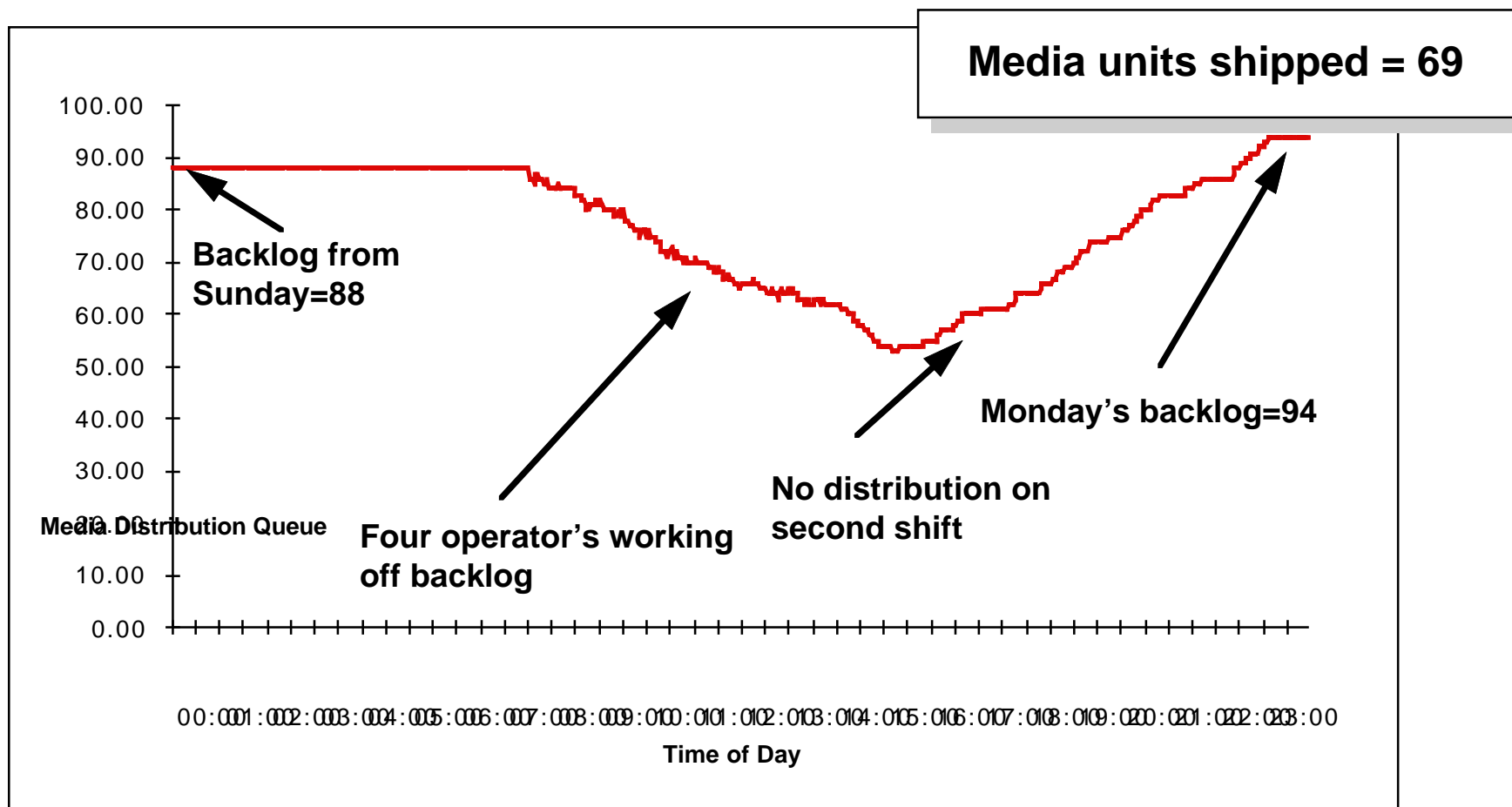
Monday, 23-Feb-98, LaRC DAAC

50% Hard Media Data Distribution

- **% of data distributed via hard media:** **50%**
- **Backlog jobs from Sunday:** **88**
- **Avg time to build and prepare media:** **00:12:00**
- **Job time variability:** **00:06:00**
- **Productivity of each of 3 Data I/D Techs.:** **0.75**
- **Productivity of Sys. Admin/Comp. Oper.:** **0.50**

Monday, 23-Feb-98, LaRC DAAC

50% Hard Media Data Distribution Backlog



Monday, 23-Feb-98, LaRC DAAC

50% Hard Media Data Distribution

- **% of data distributed via hard media:** **50%**
- **Backlog jobs from Sunday:** **88**
- **Avg time to build and prepare media:** **00:06:00**
- **Job time variability:** **00:02:00**
- **Productivity of each of 3 Data I/D Techs.:** **0.75**
- **Productivity of Sys. Admin/Comp. Oper.:** **0.50**

Monday, 23-Feb-98, LaRC DAAC

50% Hard Media Data Distribution Backlog

